



## RESOURCES TO HELP YOU PROTECT YOUR DRINKING WATER SUPPLY

### COMPREHENSIVE PLANNING AND GROUNDWATER FACT SHEET 2

#### GROUNDWATER COORDINATING COUNCIL

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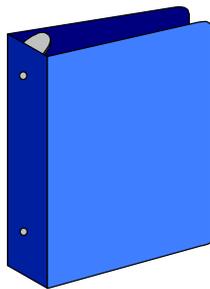
Over 95% of Wisconsin's communities and about 75% of Wisconsin residents rely on groundwater for their drinking water supply. In addition, groundwater is used widely by agriculture and industry. Groundwater also recharges Wisconsin's lakes, rivers, streams and wetlands, maintaining the vitality of the entire ecosystem. In order to plan for the future, it is important that you consider both the quantity and quality of groundwater available to your community. The future of your community depends on having a safe and dependable supply of groundwater. How do you find out about your groundwater resources? Through a series of questions, this fact sheet describes what information you'll need to address groundwater in your comprehensive ("Smart Growth") plan and where to go to find that information.

#### **Where does your community's groundwater come from?**

It is important to identify both the geologic materials or the geologic setting from which your community's groundwater comes and the recharge area which contributes water to your well(s).

#### ***What geologic materials provide water for your community's well(s)?***

- Your local water utility should have engineering reports or wellhead protection plans for each of your well(s). These plans describe local geologic and groundwater conditions in the area around your community's well(s). These reports can provide information on the geologic materials in your area and which water-bearing formation or formations (aquifers) provide groundwater to your well(s).



- Another source of local geologic and groundwater information is the Wisconsin Geological and Natural History Survey (WGNHS). The WGNHS may have reports of geologic and/or groundwater conditions in your county. You can

view the WGNHS List of Publications online at:

<http://www.uwex.edu/wgnhs/pubs.htm> or get a copy by calling 608-263-7839.

- The WGNHS also maintains records of wells drilled in the state. Find out about getting copies of well records by going online at

<http://www.uwex.edu/wgnhs/well.htm> or by calling Irene Lippelt at 608-262-7430.

- Well construction reports can also be obtained online at the Wisconsin Department of Natural Resources (WDNRs) Drinking Water System page at: <http://dnr.wi.gov/org/water/dwg/dws.htm>.
- The WDNR completed source water assessments for all public water systems between 2001 and 2004. These assessments include a summary of geologic and well construction information for each system and were hand-delivered to each water utility.
- As part of the source water assessment process, groundwater modeling was conducted to assist in source water area delineations in highly populated areas. These areas included: the Southeastern Wisconsin Regional Planning Commission counties plus Dane, Eau Claire, Fond du Lac, LaCrosse, Pierce, Rock, St. Croix and Sauk Counties. Computer models were also used for the Central Sands and the Lower Fox River Valley which incorporate parts of Adams, Juneau, Marquette, Portage, Waushara, Brown, Calumet, Outagamie and Winnebago Counties. See the WDNR wellhead protection website at <http://dnr.wi.gov/org/water/dwg/gw/wellhead.htm> for a map and contact information for these regional hydrologic studies which contain detailed geologic and groundwater information.

#### ***What land area contributes recharge to your community's well(s)?***

It's also important to identify the land area contributing water to your well through

infiltration of precipitation into the subsurface. Rain and snow seep into the ground and migrate through the soil to groundwater, which then flows toward your well(s). This area, known as the recharge area, can also allow contaminants to



enter the subsurface. If an underground storage tank or a landfill leaks contaminants into the ground within the recharge area, these contaminants could reach your community's well.

- Your water utility may have identified the recharge area for your well(s) as part of a wellhead protection plan or other report. If your community doesn't have a wellhead protection plan, you can identify the recharge area by one of several methods outlined in the WDNR publication "A Template for Preparing Wellhead Protection Plans for Municipal Wells", PUBL DG-053-00. It is available for downloading off the WDNRs wellhead protection website at <http://dnr.wi.gov/org/water/dwg/gw/whp/WHPtplat.pdf> or by calling Dave Lindorff at 608-266-9265.
- The source water assessments described above identified each well's 5-year time of travel (TOT) capture zone for each public water supply well, that is the area which contributes recharge to the well over 5 years. These source water assessment areas were determined by the groundwater modeling described above, a wellhead protection delineation if one has been done or a simple calculation with a default circle with a radius of 1200 feet around the well. The delineations were included in the assessments given municipal water utilities in 2003 and 2004.

#### **Are there sensitive areas within the recharge area that warrant protection or special consideration?**

As you gather information for your community, it is important to identify any areas that may need some special consideration. For example, there may be areas that because of soil type, geologic features, shallow depth to the water table or other reasons are sensitive to contamination. There may be critical portions of the recharge area for your wells that need to be protected to maintain adequate recharge. There may be areas where poor groundwater quality or limited groundwater availability makes it unsuitable for development of private wells.

- The 2002 publication, "Planning for Natural Resources", identifies a variety of sources for natural resource information that is available from the WDNR and other sources. It lists contact information for wetlands, floodplains, geology, soils, contaminated sites and other natural resources. The publication is available from County Extension offices, the Department of Administration's Office of Land Information Services (608-267-2707) and at [http://dnr.wi.gov/org/es/science/landuse/smart\\_growth/index.htm#planbook](http://dnr.wi.gov/org/es/science/landuse/smart_growth/index.htm#planbook).
- The WGNHS may have geologic and groundwater maps for your area that identify particularly sensitive geologic areas.
- Your community, water utility, county or the local Regional Planning Commission may have information on sensitive areas that have been identified.
- If computer groundwater models have been developed for source water assessments or other purposes, it may be possible to use them to predict the impacts of various development scenarios. For example, groundwater models could be used to identify the impacts of additional wells or new development. Use of a groundwater model should be undertaken with the assistance of a groundwater professional who can help you understand the uses and limitations of the model.

#### **How much groundwater do your wells currently produce?**

As you plan for the future, it is important to understand the current capabilities of your water supply system so you can determine what your community will require to meet future needs.

- Your local water utility should have historical pumping records for each of your wells. Water utilities are also required to submit monthly pumping records to the WDNRs Bureau of Drinking Water and Groundwater. Using data from those months when water use is highest (typically summer), you can calculate a worst case average daily use per person.
- Your local water utility should be able to look at current use compared to well capacity to determine how close your well system is to capacity. If it is near capacity, then a new well may be needed soon. Using pump capacity data from your wells to estimate long-term well productivity can

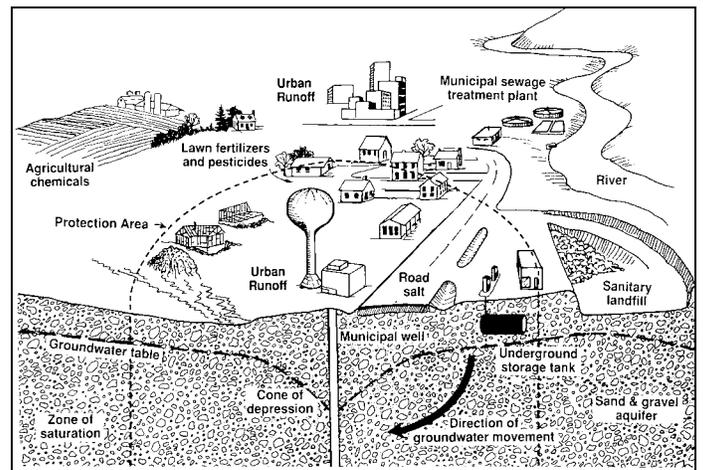
give an inaccurate assessment since most pumps aren't designed to work continuously at their maximum capacity. It is also important to remember that, if your wells are close together, increased pumping by one of the wells may cause interference with (and lower yields from) your other wells if they withdraw water from the same aquifer. This increased pumping may impact other nearby wells, e. g. industrial wells or private wells.

**What are the existing and potential contaminant sources that could impact your wells?**

In order to protect your water supply, it is important to know if there are any contaminant sources within the recharge area of your well that might contaminate your well. This would include any known sources of contamination as well as potential threats to your wells. Figure 1 shows some potential contaminant sources.

- For the source water assessments described above, the WDNR developed a geographic information system (GIS) database with contaminant sources identified from some of the databases listed above. From this GIS database and other information, maps showing potential contaminant sources for all public water supply wells were included in the source water assessments given to water utilities in 2003 and 2004.
- Your water utility should have completed a contaminant source inventory either for a wellhead protection plan or for a vulnerability assessment to justify a waiver from water quality monitoring requirements. If a contaminant source inventory hasn't been completed for the recharge area around your wells, you can download a copy of "A Guide for Conducting Potential Contaminant Source Inventories for Wellhead Protection" from the WDNR's website at <http://dnr.wi.gov/org/water/dwg/gw/whp/ContamSI.pdf> or by calling David Lindorff at 608-266-9265.
- Another source of potential contaminant source information is the WDNR publication "Directory of Groundwater Databases". It identifies a number of databases that contain information on potential contaminant sources. It is available for downloading at <http://dnr.wi.gov/org/water/dwg/gw/pubs/directory.pdf> or by calling David Lindorff at 608-266-9265.

- A summary of contaminant source inventory resources on the web is available at <http://dnr.wi.gov/org/water/dwg/gw/whp/WHPnews6.pdf>.
- The WDNR's Bureau of Remediation and Redevelopment's Tracking System (BRRTS) is the program's main database for tracking contaminated properties. It can be accessed on the web at <http://dnr.wi.gov/org/aw/rr/brrts>. The Bureau also maintains the GIS Registry of Closed Remediation Sites at: <http://gomapout.dnr.state.wi.us/org/at/et/geo/gwur/index.htm>.
- The Department of Agriculture, Trade and Consumer Protection website (<http://datcp.state.wi.us/arm/agriculture/pest-fert/pesticides/atrazine/index.html>) contains maps of atrazine prohibition areas in the state. Contact the Agriculture Chemical Cleanup Program (<http://datcp.state.wi.us/arm/agriculture/pest-fert/pesticides/accp/contact.html>) regarding the location of sites contaminated by storage, handling or spillage of agricultural chemicals.
- The Department of Commerce underground storage tank database is located at: <http://www.commerce.state.wi.us/ER/ER-EN-tanks-info.html>.



**Figure 1. Some potential contaminant sources of groundwater and water supply wells.**

**Does the quality of the groundwater from your wells meet drinking water standards?**

In order to plan for the future, you need to understand whether there are any problems with your current water quality that need to be addressed.

- Your water utility is required to sample its wells to make sure its groundwater quality complies with drinking water standards. Checking its records can determine if there are any existing contamination problems. All public water supply systems are required to submit to their customers a Consumer Confidence Report (CCR) by July first of each year that describes the quality of the water it is providing. Your water utility should have a copy of the most recent as well as past CCRs.
- It is also important to check the historical record of sampling results for each well back to when it was installed. This information can be valuable to determine if there are any trends of increasing contaminant concentrations that might not be apparent from a cursory data evaluation. This can be an important planning consideration if a new well is needed to address a contamination problem.
- Your water utility is required to provide sampling results to the WDNR's Bureau of Drinking Water and Groundwater. This information can be found for your utility at <http://dnr.wi.gov/org/water/dwg/dws.htm>.

Answering the above questions can provide a framework for planning for water supply protection. Using the above information, you can make informed decisions to make sure your water supply is protected for the future. In conjunction with other information, you can assess how much water you will need in the future and where that water will come from. Will additional wells be needed and, if so, where should they be located to minimize potential contamination problems?

### **Wellhead protection/source water protection**

One of the ways that communities can protect their water supply is through wellhead protection planning. Through this program, a community can identify the recharge area for its well or wells, inventory potential contaminant sources within that area and take steps to manage that area to protect its wells from contamination.



In an effort to assist communities in their wellhead protection efforts, the WDNR prepared source water assessments for all public water supply systems in the state. This effort was required by the 1996 Amendments to the Safe Drinking Water Act. Each assessment contains a map showing the source water assessment area for each public water supply well or surface water source and the potential contaminant sources within the source water assessment area. The assessment also contains a determination of the susceptibility of each well or intake to contamination. The WDNR will work with communities to use the source water assessment information to develop a wellhead protection plan. Summaries of each assessment are available at the WDNR source water assessment website at <http://dnr.wi.gov/org/water/dwg/swap/index.htm> or call Jeff Helmuth at 608-266-5234 for more information.

For more information on Wisconsin's wellhead protection program or assistance with wellhead protection planning, visit the WDNR website at <http://dnr.wi.gov/org/water/dwg/gw/wellhead.htm> or call Dave Lindorff at 608-266-9265.

**This is one of a series of groundwater factsheets designed to provide information to assist communities with comprehensive planning. Other factsheets and more detailed information to assist planners can be found at the Groundwater Coordinating Council (GCC) web site, <http://dnr.wi.gov/org/water/dwg/gcc/> or the WDNR Land Use Team website at <http://dnr.wi.gov/org/es/science/landuse/index.htm>.**

Acknowledgments: Illustration, page 3 from WDNR publication WR 312-92 Determining Wellhead Protection Boundaries – An Introduction.

**Comprehensive Planning and Groundwater Fact Sheets were produced by GCC subcommittee members Dave Lindorff, WI Department of Natural Resources; Chris Mechenich, Central WI Groundwater Center; and Chuck Warzecha, WI Department of Health and Family Services.**

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